

## CLAIMS

What is claimed is:

1. A method of determining an internal temperature estimate of a vehicle battery comprising:

estimating an initial internal temperature of the battery;

determining a heat source temperature that is indicative of a temperature of an engine block;

determining a transfer function of airflow;

determining an integration function of the transfer function of airflow and the heat source temperature; and

updating a current internal temperature of the battery based on the integration function and the initial internal temperature.

2. The method of claim 1 wherein estimating the initial internal temperature includes estimating the initial internal temperature based in part on an engine off time.

3. The method of claim 2 wherein estimating the initial internal temperature further includes estimating the initial internal temperature based in part on heat dissipation of at least one of the battery and the engine block.

4. The method of claim 1 wherein determining the heat source temperature includes determining an engine coolant temperature and an ambient temperature.

5. The method of claim 4 further comprising determining a difference between the engine coolant temperature and the ambient temperature.

6. The method of claim 1 wherein determining the transfer function of airflow includes determining at least one of vehicle movement airflow and fan airflow.

7. The method of claim 1 wherein determining the fan airflow includes determining the fan airflow according to at least one of a fan status signal and an engine speed.

8. The method of claim 7 wherein determining the transfer function of airflow includes determining the transfer function according to a vehicle speed, the fan status signal, and the engine speed.

9. The method of claim 1 wherein updating the current internal temperature includes updating the current internal temperature based on heat dissipation of the battery.

10. The method of claim 1 wherein estimating an initial internal temperature includes determining whether the battery was disconnected.

11. The method of claim 10 further comprising assigning a default value to the initial internal temperature if the battery was disconnected.

12. The method of claim 11 wherein the default value is an ambient temperature.

13. The method of claim 1 further comprising determining whether power to the engine is terminated.

14. The method of claim 13 further comprising storing at least one of the current internal temperature, the heat source temperature, and a current ambient temperature to a vehicle memory if the power to the engine is terminated.